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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,901	05/02/2001	Masajiro Inoue	SIW-008	7510

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LAHIVE & COCKFIELD
28 STATE STREET
BOSTON, MA 02109

EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/04/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

#24

Office Action Summary	Application No. 09/847,901	Applicant(s) INOUE ET AL.	
	Examiner Raymond Alejandro	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 05/02/01 (paper # 2) has been considered by the examiner.

Drawings

3. Figures 11-12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 70a. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "C" in Figure 12. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 2 recites the limitation "the projection" in line 5. There is insufficient antecedent basis for this limitation in the claim. Although claim 2 recites "a projecting portion", the recitation "the projection" per se lacks antecedent basis. Thus, if "the projection" is intended to refer to the "projection portion", applicants are suggested to recite the same terminology so as to have a better understanding of the claim.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-2 and 5 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending

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Application No. 09/847895 (**Patent Application Publication US 2002/0031698**) as evidenced by Jones 6007933.

The copending Application No. 09/847895 claims the following (claims 1-2):

1. A fuel cell comprising:
 - a membrane electrode assembly having a solid polymer electrolyte membrane, an anode side diffusion electrode disposed at one side of the solid polymer electrolyte membrane, and a cathode side diffusion electrode disposed at the other side of the solid polymer electrolyte membrane;
 - a pair of separators which hold the membrane electrode assembly;
 - a projecting portion which extends from the solid polymer electrolyte membrane and which projects from the peripheries of the anode side diffusion electrode and the cathode side diffusion electrode; and
 - a seal, provided onto the separators, which was liquid sealant at the time of application, wherein the seal makes contact with the projecting portion while the membrane electrode assembly is disposed between the separators.
2. A fuel cell according to claim 1, wherein the seal is provided in grooves formed in the separator.

As to the limitations of an anode side diffusion electrode comprising an anode electrode, and a first gas diffusion layer, and the cathode side diffusion electrode comprising a cathode electrode, and a second gas diffusion layer, it is noted that the copending Application No. 09/847895 inherently teaches such components because both the anode side diffusion electrode and the cathode side diffusion electrode (as instantly claimed in both co-pending applications) are understood to comprise respective anode electrode and its related gas diffusion element as well as respective cathode electrode and its related gas diffusion element. In this regard, it is noted that the claim language of copending Application No. 09/847895 reciting "an anode side diffusion electrode" and "a cathode side diffusion electrode" inherently encompasses that "the

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anode side diffusion electrode", at least, comprises an electrode portion and a gas diffusion portion as well as that "the cathode side diffusion electrode", at least, comprises another electrode portion and gas diffusion portion, too. However, in order to support the foregoing, Jones 6007933 is further cited herein to evidence copending Application No. 09/847895 regarding this. Accordingly, Jones '933 (see col 6, lines 44-50 and col 6, line 56 to col 7, line 9) evidences copending Application No '895 in that respective anode and cathode side diffusion electrodes include: the anode and cathode sides, and anode and cathode gas diffusion layers, respectively, due to the intrinsic implication of the combined language reciting anode and cathode diffusion electrodes. Hence, those of ordinary skill in the art would recognize that anode and cathode side diffusion electrodes comprises the anode and cathode side per se and gas diffusion elements on each side.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones 6007933.

The instant application is directed to a fuel cell wherein the disclosed inventive concept comprises the specific seal feature. Other limitations include the projecting portion, and the particular seal contact element.

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As to claim 1:

Jones discloses a fuel cell assembly including end plates and current collectors/conductor plates with a working section therebetween (col 5, lines 15-20); wherein working section includes a number of layers (col 5, lines 25-26); preferably, a plurality of layers form one or more PEM-type fuel cells (col 5, lines 35-38). PEM represents a proton exchange membrane or polymer Electrolyte membrane, the PEM is a solid polymer electrolyte (col 1, lines 26-38).

Figure 3 shows fluid flow plates serving as flow field plates in a fuel cell.

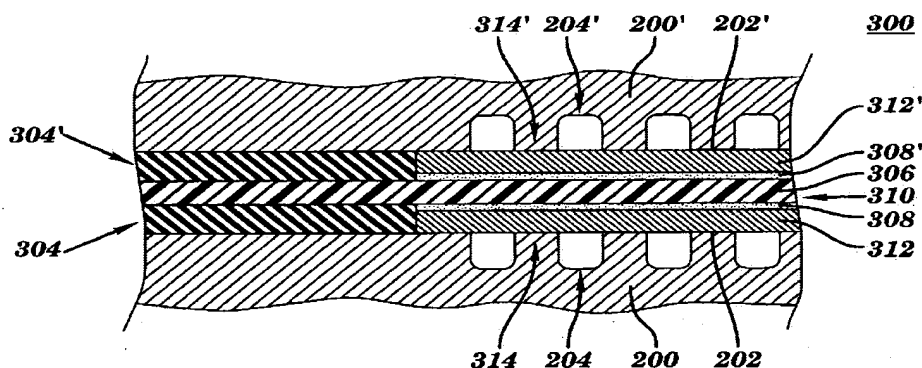


FIG. 3

As seen in Figure 3, fuel cell 300 includes the membrane electrode assembly (MEA) 310 comprising a solid polymer electrolyte 306, catalyst 308 and 308' which facilitate chemical reaction are applied to the anode and cathode sides, respectively of the solid polymer electrolyte. This unit can be referred to as a membrane electrode assembly (col 6, line 56 to col 7, line 4). The MEA is sandwiched between anode and cathode gas diffusion layers 312 and 312', respectively (col 7, lines 5-8).

For purposes of illustration, Figure 3 also depicts the fuel cell with fluid flow plates 200 and 200' serving as flow field plates (it is noted that separator plates are sometimes referred to as flow field plates, that is, separator plates are also conventionally known in the art as flow

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field plate), in particular, flow field plate 200 might serve as an anode side of the fuel cell, and flow field plate 200' might serve as a cathode side of the fuel cell. That is, face 202 might comprise an anode face, and face 202' might comprise a cathode face (col 6, lines 44-50).

Jones discloses that gasketing material or gaskets 304, 304' can be employed to seal peripheral holes. A given gasket might take the form of, for instance, a frame gasket made from polytetrafluoroethylene material (col 6, lines 34-42). As depicted in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312 and 312'.

With respect to gasketing material or gasket, it is noted that a gasket is a material or a member used to make a joint fluid tight. Accordingly, gasketing material is a sealing agent which provides a tight closure to prevent the passage or return of fluids so as to close or male secure against access, leakage or passage. Thus, the gasketing material or gasket is interpreted to serve as a seal provided on the flow field plates.

****NOTE:** With respect to the limitation that the seal was liquid sealant at the time of application, it is noted that applicants disclose the liquid sealant hardens into solid sealant while maintaining certain degree of elasticity even after the seal has been formed; and that the liquid sealant is made of a thermosetting fluorine-containing (refer to page 11, third full paragraph of applicants' specification). In that, it is noted that the recitation a seal, provided onto the separators, which was liquid sealant at the time of application is interpreted as a solid seal per se because such limitation refers to the initial state of the liquid sealant at the time of application, but the final state (the working seal) of the seal is solid as the liquid sealant hardens into solid sealant; accordingly, it is noted that Jones' teaching encompasses the solid seal formed to contact

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the fuel cell components. Thus, Jones' frame gasket made from polytetrafluoroethylene material (fluorine-container polymer) is a solid sealing material employed to provide a tight closure or seal in the fuel cell.**

With respect to claim 2:

As illustrated in Figure 3, the edge of solid polymer membrane 306 extends beyond (extended/projecting portion) the end faces of the anode and cathode side; and the gasketing material 304, 304' contacts the extended portion of the solid polymer electrolyte.

Regarding claim 3:

As depicted in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312 and 312'.

With respect to claim 4:

As shown in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312-catalyst 308 and gas diffusion layers 312'-catalyst 308' which are considered to be the anode and cathode electrode sides, respectively.

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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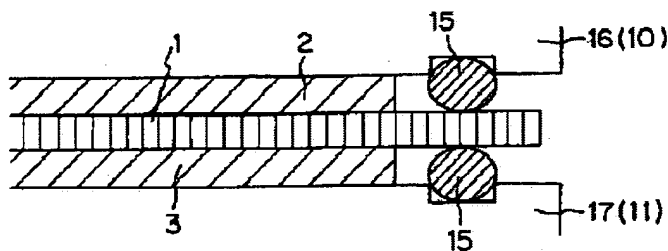
14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones 6007933 as applied to claim 1 above, and further in view of Japanese publication JP 08-148169.

Jones is applied, argued and incorporated herein for the reasons above. However, Jones does not disclose the seal provided in grooves formed in the separator.

The JP'169 publication illustrates in Figure 2 a fuel cell structure including gas diffusion electrode wherein the separators 16, 17 provide grooves which are contacted and sealed by O-ring seals 15 (Figure 2 and section 0008).

【 図 2 】



In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to seal Jones' separators by providing grooves thereon (*seal provided in grooves in the separator to seal them*) so as to obtain a seal-groove sealing structure as taught by

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the JP'169 publication as the JP'169 publication teaches that when plates or frames (separators) constitute the main enclosing member of the fuel cell structure, an O-ring seal disposed between grooves formed in the separator enhances and ensures the adhesion of both separators. Further, the O-ring-grooves sealing feature provides a sealing technique having the advantage of employing adhesive forces without damaging fuel cell elements. Thus, this provides a sealing feature that ensures a sufficient sealing effect only through light pressing of the polymeric electrolyte film of fuel cell, and preventing damages to the electrolyte film per se. *The teaching of JP'169 is also consistent with another embodiment of Jones teaching and encompassing the employment of O-ring gaskets.*

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
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